

Some notes on the practice final

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Problem 14 (arc length in polar coordinates): We didn't have any problems like this on the quizzes or mid-term and I doubt that you will have anything like this on the final. We did have a problem on the midterm which required computing the area in polar coordinates using

$$A = \frac{1}{2} \int_{\theta_1}^{\theta_2} r^2 d\theta$$

You should know how that works.

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Substitute for Problem 14: Express the arc length of the curve  $P(t) = (t^2 + 1, 2t - 4)$  between  $t = 1$  and  $t = 3$  as a definite integral. Do not evaluate the integral.

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Problem 18: (wording fixed) Find the area of the region bounded by the curves  $y = -x^2$ ,  $y = x^3$ ,  $x = -1$ , and  $x = 0$ .

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Problem 21: (This is hard.) Big hint: Suppose  $f(x)$  is the sum of the series which is given. First, figure out what the series for  $f'(x)$  is, then find its sum. You can use this to figure out what  $f(x)$  is.

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(These notes may grow in response to your comments, which are welcome.)